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THE ROUND LIGAMENT OF NEBRASKA PROBOSCIDEANS

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THE ROUND LIGAMENT OF NEBRASKA PROBOSCIDEANS

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Comparisons of the acetabula of various mastodons and mammoths common to Nebraska show conclusively that absence of the round ligament is not a characteristic of the proboscidea, as generally accepted. From the specimens in our collections, there is evidence that

Fig. 1.—Left os innominatum of Eubelodon morrilli. x ⅛. The fossa is broad, deep, and noticeably pitted. The head of the femur shows a deep scar. Attention is directed to the large protruberance on the pubis for the attachment of the pectineus muscle. In Elephas, this is a pit.

Fig. 2.—Right acetabulum of Tetrabelodon willistoni. x ⅕. Shows narrow cotyloid notch, and fossa expanding and deepening towards the center.

the ligament was not only present, but was uncommonly large and well developed in the earlier Nebraska proboscideans. Examination of material collected since 1891, and preserved in the cabinets of the Nebraska State Museum and the Morrill Geological Collections, makes it apparent that all Nebraska proboscideans had round ligaments, though perhaps the latest survivors did not.

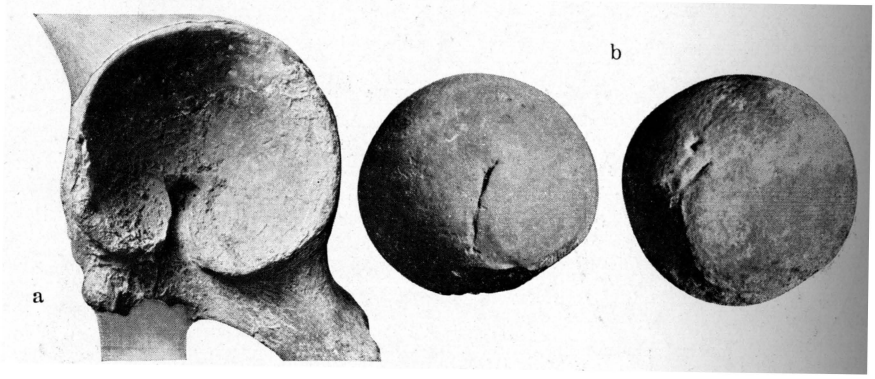

Fig. 3.—Tetrabelodon lulli. x ⅕.

a, Acetabulum covered by "Daimonelix fibers." The fossa is narrow, of medium depth, but with a deep central pit. Note the tuberosity for the attachment of the pectineus muscle, opposite a.

b, Heads of two femora, showing pronounced scars.

In the case of the longirostral mastodon of our Pliocene, the round ligaments must have been very large. The scars on the corresponding femur heads are large and unmistakable.

In the brevirostral forms from the Pleistocene, reduction of the round ligament is evident. Still the fossae are long and broad, though shallow. Some of the femur heads show scars, or slightly roughened areas for attachment, though most of them are entirely smooth, as in the later mastodons, and all of the mammoths. None of the specimens in our collections show the obliteration of the cotyloid fossae.

In modern elephants, the acetabular fossae are filled, and virtually obliterated, by osseous growth, and the femur heads are round and

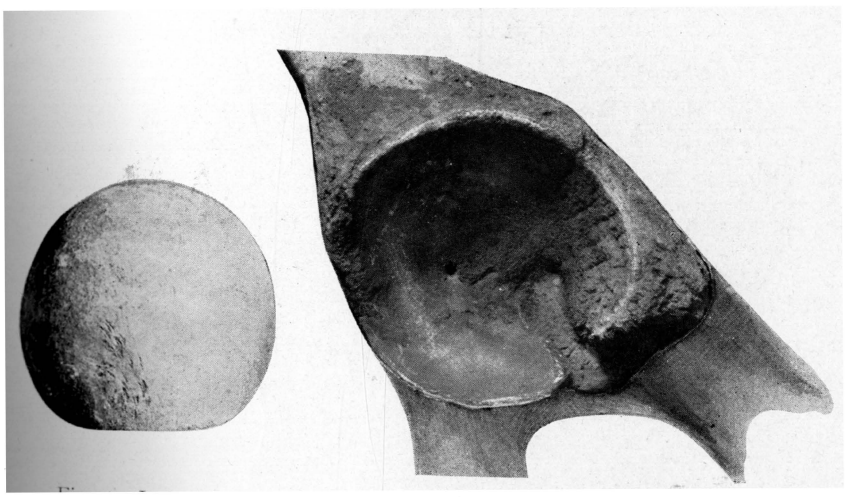

Fig. 4.—Left acetabulum of Mastodon americanus. x ⅕. Shows a well-defined, though shallow, cotyloid fossa. The femur head is without scar.

smooth. The function of the ligamentum teres is to aid in holding the head of the femur in the cotyloid cavity. So many of the femur heads in our collection show scars, that it seems more than mere coincidence.

In the Pliocene deposits of Brown County, two longirostral mastodons occur, namely Tetrabelodon willistoni, and Eubelodon morrilli. The acetabula which we have referred to Tetrabelodon willistoni are small, being scarcely more than half as large as those of mammoths. The cotyloid notch is narrow, and the fossa shallow, but expanding and deepening rapidly toward the center of the cup where it is rough and

pitted. The femora referred to this species are damaged at the scar, and cannot be reported upon at this writing.

The perfectly preserved pelvis of Eubelodon was found with the skull and mandible. Its acetabula are 6½ inches (165 mm.) across; the fossae 3 inches (76 mm.) long by 1½ inches (38 mm.) broad, and deepened centrally to a full inch (25 mm.), and they are rough and pitted for attachments. The corresponding femur heads have pronounced scars. In this case, there must have been a powerful round ligaments. See figure 1.

Fig. 5. Acetabulum of Elephas imperator. x ⅕. The fossa is distinct, though shallow; the femur head is without scar, save where struck by tools.

In the Pliocene of Cherry County, called the Snake River beds,[1] the magnificent mastodon, Tetrabelodon lulli, occurs with its associated skeletal parts. Its acetabula are 6½ inches (165 mm.) in diameter. The fossae at the notches are narrow and rather shallow, but at the center of the cotyloid cavity, they expand somewhat, and are deeply pitted. The corresponding femur head is noticeably scarred, and occasionally pitted. All this is evidence of a strong and functional liga-

1. A New Longirostral Mastodon from Cherry County; Nebr. Geol. Survey, Vol. 4, No. 36, p. 214; and Am. Jour. Sci., Vol. 39, No. 229, pp. 87-92, January, 1913.

ment. However, in none of the material at hand does the round ligament seem to be so well developed as in Eubelodon morrilli.

From the Pleistocene of the State, come a number of acetabula and femora, some of which undoubtedly belong to Mastodon americanus, the best known of the mastodons. These acetabula average 7 inches (178 mm.) across. All show long, broad, and shallow, though well-

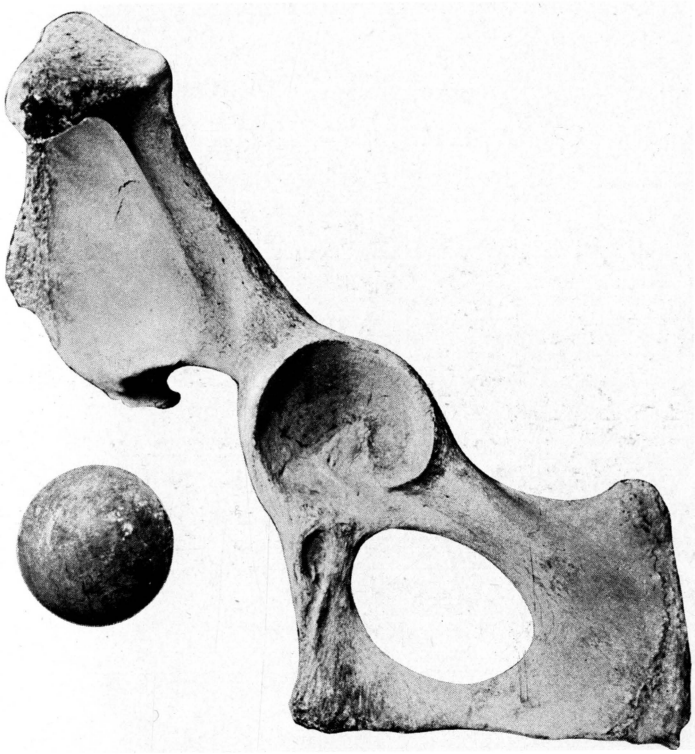

Fig. 6.—Left os innominatum of Elephas indicus. x ⅛. Shows the acetabular fossa practically obliterated. The head of the femur is round, smooth, and without a trace of the scar. The pectineus pit is distinct.

developed fossae; and a few of the corresponding femur heads show more or less distinct scars.

The mammoths, or true elephants, have large acetabula, measuring 8 to 8½ inches (203 to 216 mm.) across. The fossae are long, and broad, but shallow, while the femur heads are apparently without scars. None of the mammoths in our collection show scars on the femur head. It may be inferred that the round ligament was greatly

reduced, but perhaps not obliterated. In modern elephants, the cotyloid fossae, though unmistakably distinct, are filled, and practically obliterated by osseous growth, and the round ligament is absent.

The material in our collection is considerable, and justifies belief in the existence of the round ligament. It even seems probable that familiarity with the cotyloid fossae may serve in recognizing forms, and in relating them to their respective horizons.

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